United States Department of Agriculture
Forest Service
R3 Regional Office
333 Broadway SE
Albuquerque, NM 87102
FAX (505) 842-3800
V/TTY (505) 842-3292

File Code: 3420
Date: June 2, 2004

Darlene Koontz
Superintendent
Bandelier National Monument
HCR 1, Box 1
Suite 15
Los Alamos, NM 87544

Dear Ms Koontz:

At the request of Brian Jacobs, Bandelier National Monument, our staff entomologist, Terry Rogers, met with Brian and Craig Allen, U.S. Geological Survey, on April 1, 2004 to identify the cause of juniper die-back occurring throughout the piñon-juniper woodland type at Bandelier National Monument (Figures 1 and 2). Brian and Craig were concerned about this wide-spread die-back since most of the piñons at these lower sites were killed in 2002 and 2003 by the piñon ips beetle, *Ips confusus*.

Figure 1. Juniper mortality, Bandelier National Monument

Figure 2. Live juniper with extensive branch dieback.

The results of Terry's examination revealed that the juniper die-back is primarily due to drought stress. According to our Southwestern Coordination Center Fire Meteorologist, Chuck Maxwell, we have been in a sustained dry period since 1999. There has been little to no significant snow pack during the winter and spring months and very minor amounts of precipitation during the summer monsoon period for the past five years. Last winter was very dry, and last year (2003) was considered to be the driest year on record when compared to the last 100 years. Should this

drought continue to persist as currently predicted, we can expect to see more juniper mortality in the lower elevation woodlands and perhaps even major shifts in vegetation composition in the higher elevation conifer forest ecosystems.

Examination of two live trees with extensive branch die-back revealed signs of recent borer activity. Trees attacked by borers are recognized by the small round to oval exit holes formed by the emerging adults (Figure 3). These beetles could either be buprestids or cerambycids, both of which typically attack suppressed, weakened, dead, drought-stressed, or recently felled trees. More specific identification is impossible without an adult beetle specimen. Females lay eggs in bark crevices or on branches of living trees. Larvae bore first into the cambial region of the trunk, branches, or roots and then bore into the heartwood, mining it extensively. Adults then emerge in the spring. No insect activity was detected on the dead junipers examined.

Figure 3. Exit hole in juniper formed by emerging adult borer.

If you have any questions concerning this site visit, please contact Terry at (505) 842-3287 or by e-mail at trogers@fs.fed.us.

Sincerely,

/s/ Debra Allen-Reid
DEBRA ALLEN-REID
New Mexico Zone Leader,
Forest Health

cc: Craig Allen., U.S. Geological Survey
cc: Leonard Lucero, Regis Cassidy